Louisiana Department of Environmental Quality (LDEQ)
Office of Environmental Services

STATEMENT OF BASIS

Creole Trail LNG, L.P.
Creole Trail LNG Import Terminal
Cameron, Cameron Parish, Louisiana
Agency Interest Number: 130402
Activity Number: PER20050001
Proposed Permit Number: 0560-00239-V0

I. APPLICANT

Company:
Creole Trail LNG, L.P.
700 Milam St., Ste. 800
Houston, Texas 77002

Facility:
Creole Trail LNG LP - Creole Trail LNG Import Terminal
@ Calcasieu Pass off Hwy 27, 4 Mi NW of Cameron,
Cameron Parish, Louisiana
Approximate UTM coordinates are 465.923 kilometers East, 3297.481 kilometers North, zone 15

II. FACILITY AND CURRENT PERMIT STATUS

Creole Trail LNG, L.P., a wholly owned subsidiary of Cheniere LNG, Inc., proposes to build a liquefied natural gas (LNG) import terminal at Calcasieu Pass, four miles northwest of the city of Cameron in Cameron Parish, Louisiana. This is the initial Part 70 Operating Permit for the facility, and it includes provisions of the Prevention of Significant Deterioration (PSD) review from Permit PSD-LA-714.

III. PROPOSED PROJECT/PERMIT INFORMATION

Application

A permit application and Emission Inventory Questionnaire were submitted by Creole Trail LNG, L.P. dated August 16, 2005, along with supplemental information dated October 19, November 3, 8, 9, and 30, and December 21, 2005, January 6, 2006, February 3, 2006, April 13, 2006, and May 11, 2006 requesting a Part 70 operating permit and a PSD permit for Creole Trail LNG Import Terminal.

Project

Creole Trail LNG Import Terminal will import, store, and vaporize liquefied natural gas (LNG) for supply to US natural gas markets. The average send out rate will be 3.3 MMM scf/day (billion cubic feet per day) of gasified LNG, with an installed capacity of approximately 3.84 MMM scf/day of gasified LNG. A pipeline system will be built connecting the new LNG terminal with existing interstate and intrastate natural gas pipeline systems to provide access to Gulf Coast, Midwest, northeast, and Atlantic markets.

The new LNG terminal will consist of the following:

- A ship unloading slip with two protected berths, each equipped with three unloading arms and one vapor return arm;
- Four LNG storage tanks, each with a usable volume of 5.65 MM scf (million cubic feet);
- Twenty-one high pressure LNG send out pumps, each with a capacity of 1692 gallons/min;
- Twenty-one submerged combustion vaporizers (SCVs), each with a capacity of 183 MM scf/day;
- Three boil off gas (BOG) compressors; and
- Ancillary utilities, buildings, and service facilities at the LNG terminal including four generator turbines, capable of generating 30 MW each and a total of 56.6 MW of electrical power; two standby diesel generators capable of generating 1500 kW each; and two diesel firewater pumps rated at 660 hp and 550 hp, respectively.

Liquefied natural gas (LNG) will be received from marine tankers that will berth at the terminal's loading dock. LNG is transferred by onboard ship pumps from the marine vessels into pressurized tanks for storage via stainless steel unloading arms and cryogenic piping. Each berth has one of the unloading arms equipped to operate in either liquid or vapor service. The unloading arms will be free draining and will have nitrogen connections for displacing LNG prior to disconnect.

Cryogenic storage consist of four double walled, single containment, top entry LNG storage tanks with three electric driven submersible LNG pumps and one spare pump installed in each tank. The insulated tanks are designed to store LNG at a temperature of -260 degrees Fahrenheit and a maximum internal pressure of 2.5 psig. All piping will penetrate from the top of the tanks for safety concerns. The LNG pumps deliver LNG to the high-pressure send out pumps via the boil-off gas (BOG) condenser. The send out pumps route LNG to the vaporizers to be converted to natural gas. The vaporized natural gas is measured and sent to transmission pipelines.

The submerged combustion vaporizers (SCVs) are highly efficient systems used to vaporize incoming liquid natural gas from a temperature of -260 F to 40 F. Each SCV contains a burner unit, a tube bundle, and a weir assembly. The vaporizer tank encloses these components. The weir assembly contains a water bath in which the tube bundle is submerged. The burner unit, which is partially submerged in water, combusts natural gas and routes the product directly into the water bath causing a rising froth flow. This rising flow is confined within the weir assembly, which surrounds the tube bundle. The water falls back over the weir assembly to contact with the partially submerged burner before recirculation occurs. Because the combustion products directly contact the water bath, the submerged combustion vaporizer systems are able to reach heat transfer efficiencies between 90 and 99%.

Four turbines, capable of generating 30 MW each and a total of 56.6 MW of electrical power, will be installed at the facility. The turbines will only be used to power the Creole Trail LNG Import Terminal. There will be no power sold to the electrical grid. These turbines will operate continuously.

Standby diesel generators will be installed to serve as reliable sources of power for lighting and other emergency equipment in the event of a prolonged power failure. These generators will each operate 500 hours per year or less, except as specified in the permit for operation in an emergency situation.

Diesel engine firewater pumps will be installed to serve as a reliable water source in the event electric power is lost during a fire. These firewater pumps will be rated at 660 hp and 550 hp, respectively, and will each be limited to 500 hours per year of operation.

Proposed Permit

Permit 0560-00239-V0 will be the initial Part 70 operating permit and PSD-LA-714 will be the initial PSD for the Creole Trail LNG Import Terminal.

Permitted Air Emissions

Construction is scheduled to begin in 2007 with operation commencing in the second half of 2010. Emission sources associated with the proposed Creole Trail LNG Import Terminal include the twenty-one SCVs, the four generator turbines, two standby generators, two firewater pumps, and fugitive and insignificant emission sources.

Estimated emissions, in tons per year, are as follows:

		Prevention Of Significant Deterioration (PSD)		
Pollutant	**Emissions**	**Major Source Level**	**de minimis**	**Review required?**
PM	49.208	100	25	Yes
PM_{10}	49.208	100	15	Yes
SO_2	4.82	100	40	No
NO_x	867.86	100	40	Yes
CO	944.06	100	100	Yes
VOC*	52.79	100	40	Yes

* Surrogate for ozone

Increases in NO_x and CO above major source thresholds trigger review under the PSD program and LAC 33:III.509. Increases of particulate matter (PM/PM_{10}) and VOC are significant and will also require PSD review.

IV REGULATORY ANALYSIS

The applicability of the appropriate regulations is straightforward and provided in the Specific Requirements section of the proposed permit. Similarly, the Monitoring, Reporting, and Recordkeeping necessary to demonstrate compliance with the applicable terms, conditions, and standards are also provided in the Specific Requirements section of the proposed permit.

Applicability and Exemptions of Selected Subject Items

ID No:	Requirement	Notes
Facility	Compliance Assurance Monitoring (CAM) [40 CFR 64]	DOES NOT APPLY. Emission sources are not equipped with add-on controls or would trigger MACT if uncontrolled.
	Subpart HHH - National Emission Standards for Hazardous Air Pollutants from Natural Gas Transmission and Storage Facilities [40 CFR 63]	DOES NOT APPLY. Facility is a minor source of hazardous air pollutants.
	Chemical Accident Prevention Provisions [40 CFR 68] Chemical Accident Prevention and Minimization of Consequences [LAC 33:III.Chapter 59]	DOES NOT APPLY. Per LAC 33:III.5907, facility does not produce, process, handle, or store any substance listed in paragraph 68.130 or Tables 59.0 and 59.1 of Chapter 59 in an amount greater than the threshold quantity.

Creole Trail LNG, L.P.
Creole Trail LNG Import Terminal
Cameron, Cameron Parish, Louisiana
Agency Interest Number: 130402

ID No:	Requirement	Notes
Facility (Cont.)	Comprehensive Toxic Air Pollutant Emission Control Program [LAC 33:III.Chapter 51]	DOES NOT APPLY. Per LAC 33:III.5101.A, facility is not a major source for Toxic Air Pollutants (TAPs) under Chapter 51 of LAC 33:III. TAP
	Odor Regulations [LAC 33:III.Chapter 29]	DOES NOT APPLY. Per LAC 33:III.2901.B, facility is not a source of odorous substances emitted into the ambient air.
	Crude Oil and Condensate [LAC 33:III.2104]	DOES NOT APPLY. Per LAC 33:III.2104.A, potential flash emissions are less than 100 TPY of VOC.
LNG Dock and Terminal	Emission Standards for Volatile Organic Compounds (VOCs) - Marine Vapor Recovery [LAC 33:.III.2108]	DOES NOT APPLY. Unloading of LNG with a VOC true vapor pressure <1.5 psia at loading temperature (-260 F) and pressure (75 psig)
LNG Storage Vessels	Control of Emissions of Organic Compounds-Storage of volatile Organic Compounds [LAC 33:III.2103]	DOES NOT APPLY. Tanks are used to store LNG with a VOC true vapor pressure <1.5 psia at storage temperature (-260 F) and pressure (2.5 psig). [LAC 33:III.2103.B]
EQT 1 thru EQT 4 Diesel Engines	National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE) [40 CFR 63, Subpart ZZZZ]	DOES NOT APPLY. Facility is a minor source of hazardous air pollutants.
EQT 1 thru EQT 29 Combustion Sources	Emission Standards for Sulfur Dioxide Emission Limitations [LAC 33:III.1503.C] Emission Standards for Sulfur Dioxide Recordkeeping and Reporting [LAC 33:III.1513]	EXEMPT. Unit emits less than 250 tons of SO_2 per year. Record and retain at the site for at least 2 years the data required to demonstrate compliance with or exemption from SO_2 standards of Chapter 15. Compliance data shall be reported annually in accordance with LAC 33:III.918.
EQT 9 thru EQT 29 Submerged Combustion Vaporizers	Compliance Assurance Monitoring (CAM) [40 CFR 64]	DOES NOT APPLY. Emission sources are equipped with add-on controls (water injection), but would not exceed 100 TPY NO_x for each SCV if uncontrolled.

ID No:	Requirement	Notes
DSLTNK-01 thru DSLTNK-04 Diesel Tanks	NSPS Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including *Petroleum Liquid Storage Vessels for* Which Construction, Reconstruction, or Modification Commenced after July 23, 1984. [40 CFR 60.110b]	DOES NOT APPLY. Storage tank has total capacity <19,813 gallons (75 m^3).
	Control of Emissions of Organic Compounds-Storage of volatile Organic Compounds [LAC 33:III.2103]	DOES NOT APPLY. Tank is used to store diesel fuel with a true vapor pressure <1.5 psia. [LAC 33:III.2103.B]
The above table provides explanation for the exemption status or non-applicability of a source cited by 1, 2 or 3 in the matrix presented in Table 1 above of this permit.		

Prevention of Significant Deterioration/Nonattainment Review

The Creole Trail LNG Import Terminal is a new major source under the Prevention of Significant Deterioration program and LAC 33:III.509. Therefore, the requested permit was reviewed in accordance with PSD regulations for nitrogen oxide (NO_x), carbon monoxide (CO), particulate matter (PM/PM_{10}), and volatile organic compound (VOC) emissions; those pollutants which will be above PSD significance levels. Emissions of LAC 33:III.Chapter 51 regulated toxic air pollutants (TAP) have been reviewed pursuant to the requirements of the Louisiana Air Quality Regulations. The selection of control technology based on the Best Available Control Technology (BACT) analysis included consideration of control of toxic materials.

Estimated emissions due to this facility, in tons per year, are as follows:

		Prevention Of Significant Deterioration (PSD)	
Pollutant	**Emissions**	**Major Source Level**	**de minimis**
PM	49.21	100	25
PM_{10}	49.21	100	15
SO_2	4.82	100	40
NO_x	867.86	100	40
CO	944.06	100	100
VOC*	52.79	100	40

* Surrogate for ozone

Increases in NO_x and CO above major source thresholds trigger review under the PSD program and LAC 33:III.509. Increases of particulate matter (PM/PM_{10}) and VOC are significant and will also require PSD review.

Creole Trail LNG, L.P.
Creole Trail LNG Import Terminal
Cameron, Cameron Parish, Louisiana
Agency Interest Number: 130402

BACT Requirements

NO_x, CO, PM/PM_{10}, and VOC emissions are above PSD de minimis levels and must undergo PSD analysis. Controls of these emissions were analyzed using a "top down" approach. The selection of control technology based on the Best Available Control Technology (BACT) analysis included consideration of control of toxic materials.

For the four LNG Storage Tanks, Dock, and Terminal: limit VOC emissions by employing good control and operating practices.

For each Submerged Combustion Vaporizers: use low NO_x burners with water injection, employ good combustion practices including the use as fuel of natural gas in the form of vaporized LNG from the boil-off gas (BOG) compressors (or equivalent), and limit exhaust emissions as specified in Specific Condition 1 of PSD-LA-714.

For the Emergency Diesel Firewater Pump and Booster Pump Engines: use equipment to provide power to pump water for fire suppression or protection and operate only during emergency situations, except for periodic use required for testing and maintenance of the unit; employ good combustion practices and good engine design incorporating Fuel Injection Timing Retardation (ITR) with consideration to the optimization of fuel consumption, emissions, and required performance, use low ash and low sulfur diesel, and limit exhaust emissions as specified in Specific Condition 1 of PSD-LA-714.

Emergency Diesel Generators: equipment shall operate only during emergency situations, except for periodic use required for testing and maintenance of the unit; employ good combustion practices and good engine design incorporating Fuel Injection Timing Retardation (ITR) with consideration to the optimization of fuel consumption, emissions, and required performance, use low ash and low sulfur diesel, and limit exhaust emissions as specified in Specific Condition 1 of PSD-LA-714.

Generator Turbines: use Dry Low Emissions (DLE) combustor technology with lean premix of air and fuel, employ good combustion practices including the use as fuel of natural gas in the form of vaporized LNG from the boil-off gas (BOG) compressors (or equivalent), and limit exhaust emissions as specified in Specific Condition 1 of PSD-LA-714.

Other Requirements

Emergency Diesel Firewater Pump and Booster Pump Engines: Operating time <=500 hrs/yr each. Noncompliance with this limitation is a reportable violation of the permit. Notify the Office of Environmental Compliance, Enforcement Division if operating time exceeds the maximum listed in this specific condition for any twelve consecutive month periods.

Emergency Diesel Generators: Operating time <= 500 hrs/yr each, except as specified in this permit for operation in an emergency situation. Noncompliance with this limitation is a reportable violation of the permit. Notify the Office of Environmental

Compliance, Enforcement Division if operating time exceeds the maximum listed in this specific condition for any twelve consecutive month periods.

Emergency Diesel Generators: Operation in an emergency situation above the 500 hrs/yr limit may be authorized with prior approval by DEQ (variance) for situations where all four primary power turbines are down or where safety issues take priority. Short periods of overlap with turbine generator operation are allowed during the shutdown and startup modes. The diesel generator engine will shutdown immediately when system power is switched to the turbine generators. Operation over the limit without prior approval of DEQ is an exceedance of this permit. Record duration of any authorized emergency operation above the 500 hrs/yr limit and keep records along with the notification of approval on site and available for inspection by the DEQ personnel.

Air Quality Analysis

Dispersion Model(s) Used: ISCST3 modeling analyses (PM10, CO), ISCST3 refined modeling analyses (NOx)

Pollutant	Time Period	Calculated Maximum Ground Level Concentration	Louisiana Toxic Air Pollutant Ambient Air Quality Standard or (National Ambient Air Quality Standard {NAAQS})	Modeled PSD Increment Consumption	Allowable Class II PSD Increment
PM_{10}	24-hour	4.92 $\mu g/m^3$	150 $\mu g/m^3$		
NO_x	Annual	44.75 $\mu g/m^3$	100 $\mu g/m^3$	10.16 $\mu g/m^3$	25 $\mu g/m^3$
CO	1-hour	1036.16 $\mu g/m^3$	40,000 $\mu g/m^3$		
CO	8-hour	456.74 $\mu g/m^3$	10,000 $\mu g/m^3$		

Prevention of Significant Deterioration regulations require an analysis of existing air quality for those pollutants emitted in significant amounts from a proposed facility. The modeling has passed for all three modeled pollutants.

The Preliminary Impact Modeling shows that the predicted concentrations for CO and PM_{10} are all below the ambient significance levels and preconstruction monitoring exemption levels. Therefore, no preconstruction monitoring, increment analysis, or refined modeling was required for these pollutants.

No de minimis air quality level is provided for ozone. However, any net increase of 100 tons per year or more of volatile organic compounds (VOC) or nitrogen oxides subject to PSD would require the performance of an ambient impact analysis including the gathering of ambient air quality data. Net increase of VOC from this facility is less than 100 tons per year; however, NO_x net increase is greater than 100 tons per year.

A Full Impact Modeling was exercised for NO_x. NAAQS Modeling predicted an annual NO_x concentration showing compliance and PSD Incremental Modeling predicted an annual incremental concentration also showing compliance.

General Condition XVII Activities

The facility will comply with the applicable General Condition XVII Activities emissions as required by the operating permit rule. However, General Condition XVII Activities are not subject to testing, monitoring, reporting, or recordkeeping requirements. For a list of approved General Condition XVII Activities, refer to the Section VIII – General Condition XVII Activities of the proposed permit.

Insignificant Activities

All Insignificant Activities are authorized under LAC 33:III.501.B.5. For a list of approved Insignificant Activities, refer to the Section IX – Insignificant Activities of the proposed permit.

V. PERMIT SHIELD

NA

VI. PERIODIC MONITORING

For periodic monitoring, refer to the Specific Requirements section of the proposed permit.

VII. GLOSSARY

Carbon Monoxide (CO) – A colorless, odorless gas, which is an oxide of carbon.

Maximum Achievable Control Technology (MACT) – The maximum degree of reduction in emissions of each air pollutant subject to LAC 33:III.Chapter 51 (including a prohibition on such emissions, where achievable) that the administrative authority, upon review of submitted MACT compliance plans and other relevant information and taking into consideration the cost of achieving such emission reduction, as well as any non-air-quality health and environmental impacts and energy requirements, determines is achievable through application of measures, processes, methods, systems, or techniques.

Hydrogen Sulfide (H_2S) – A colorless inflammable gas having the characteristic odor of rotten eggs, and found in many mineral springs. It is produced by the reaction of acids on metallic sulfides, and is an important chemical reagent.

New Source Review (NSR) – A preconstruction review and permitting program applicable to new or modified major stationary sources of air pollutants regulated under the Clean Air Act (CAA). NSR is required by Parts C ("Prevention of Significant Deterioration of Air Quality") and D ("Nonattainment New Source Review").

Nitrogen Oxides (NO_X) – Compounds whose molecules consist of nitrogen and oxygen.

Organic Compound – Any compound of carbon and another element. Examples: Methane (CH_4), Ethane (C_2H_6), Carbon Disulfide (CS_2)

Part 70 Operating Permit – Also referred to as a Title V permit, required for major sources as defined in 40 CFR 70 and LAC 33:III.507. Major sources include, but are not limited to, sources which have the potential to emit: $\geq$ 10 tons per year of any toxic air pollutant; $\geq$ 25 tons of total toxic air pollutants; and $\geq$ 100 tons per year of regulated pollutants (unless regulated solely under 112(r) of the Clean Air Act) (25 tons per year for sources in non-attainment parishes).

PM_{10} – Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers as measured by the method in Title 40, Code of Federal Regulations, Part 50, Appendix J.

Potential to Emit (PTE) – The maximum capacity of a stationary source to emit any air pollutant under its physical and operational design.

Prevention of Significant Deterioration (PSD) – A New Source Review permitting program for major sources in geographic areas that meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. PSD requirements are designed to ensure that the air quality in attainment areas will not degrade.

Sulfur Dioxide (SO_2) – An oxide of sulfur.

Sulfuric Acid (H_2SO_4) – A highly corrosive, dense oily liquid. It is a regulated toxic air pollutant under LAC 33:III.Chapter 51.

Title V Permit – See Part 70 Operating Permit.

Volatile Organic Compound (VOC) – Any organic compound, which participates in atmospheric photochemical reactions; that is, any organic compound other than those, which the administrator of the U.S. Environmental Protection Agency designates as having negligible photochemical reactivity.